

DESCRIPTION OF THE FEMALE OF *Pherbeta limenitis*
STEYSKAL (DIPTERA: SCIOMYZIDAE), WITH NOTES ON
BIOLOGY, IMMATURE STAGES, AND DISTRIBUTION¹

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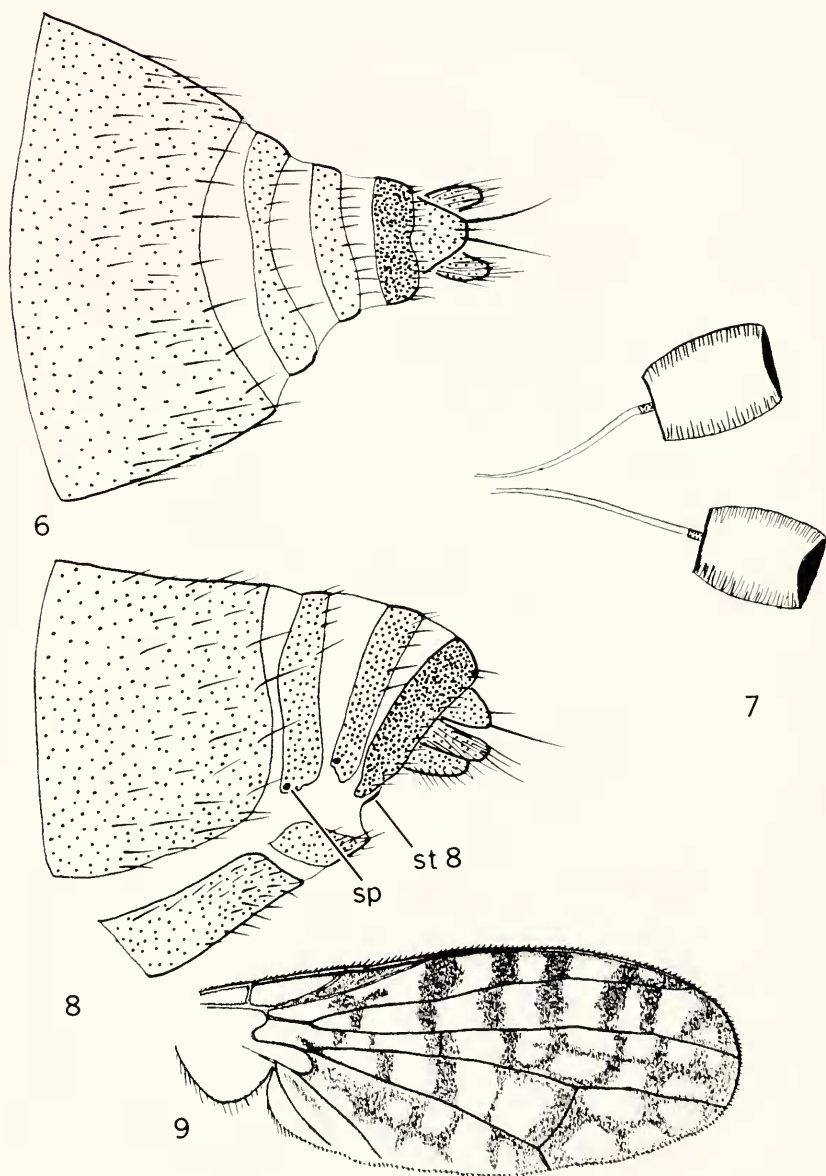
Pherbeta limenitis was described as a new genus, new species from a single male collected at North Fairhaven, New York (Steyskal, 1956). The holotype, which I have seen, is in the Cornell University Collection. A description of the previously unknown female and of the puparium, recently obtained records of 15 specimens from Connecticut, Massachusetts, New York, and Ontario, and biological notes are presented below.

FEMALE (FIG. 6-9)

The 7 specimens available fit the description of the male as given by Steyskal, except as follows. Length of wing, 3.8-4.6 mm. Front at widest part half or slightly more than half total width of head. Mid-frontal stripe bluntly tapered anteriorly. Arista brown to black, occasionally yellowish at base. Propleuron with 0-5 small hairs. Thorax with 1 presutural and 2 dorsocentral bristles, and 0 or 1 prescutellar hairs or bristles. Hind femur with 1 or 2 dorsal pre-apical bristles. Spermathecae 2, lying in segment 5; translucent brown; barrel-shaped with thick, flattened ends; about 0.125 mm in length by 0.075 mm in width; ducts short (Fig. 7). Terga 6, 7, and 8 (Fig. 6, 8) narrow, each bearing a row of bristles near posterior margin. Tergum 8 rather weakly sclerotized and infolded dorsomesally. Sternum 6 well

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FIGS. 6-9. *Pherbecta limenitis* Steyskal. FIG. 6. Postabdomen, female, dorsal. FIG. 7. Spermathecae. FIG. 8. Postabdomen, female, lateral. FIG. 9. Wing (modified from Steyskal, 1956). sp, spiracle; st 8, sternum 8.

developed, 7 apparently absent or fused with 6, and 8 represented by a pair of small, comma-shaped, sclerotized spots. Spiracles 6 and 7 in lower corners of terga.

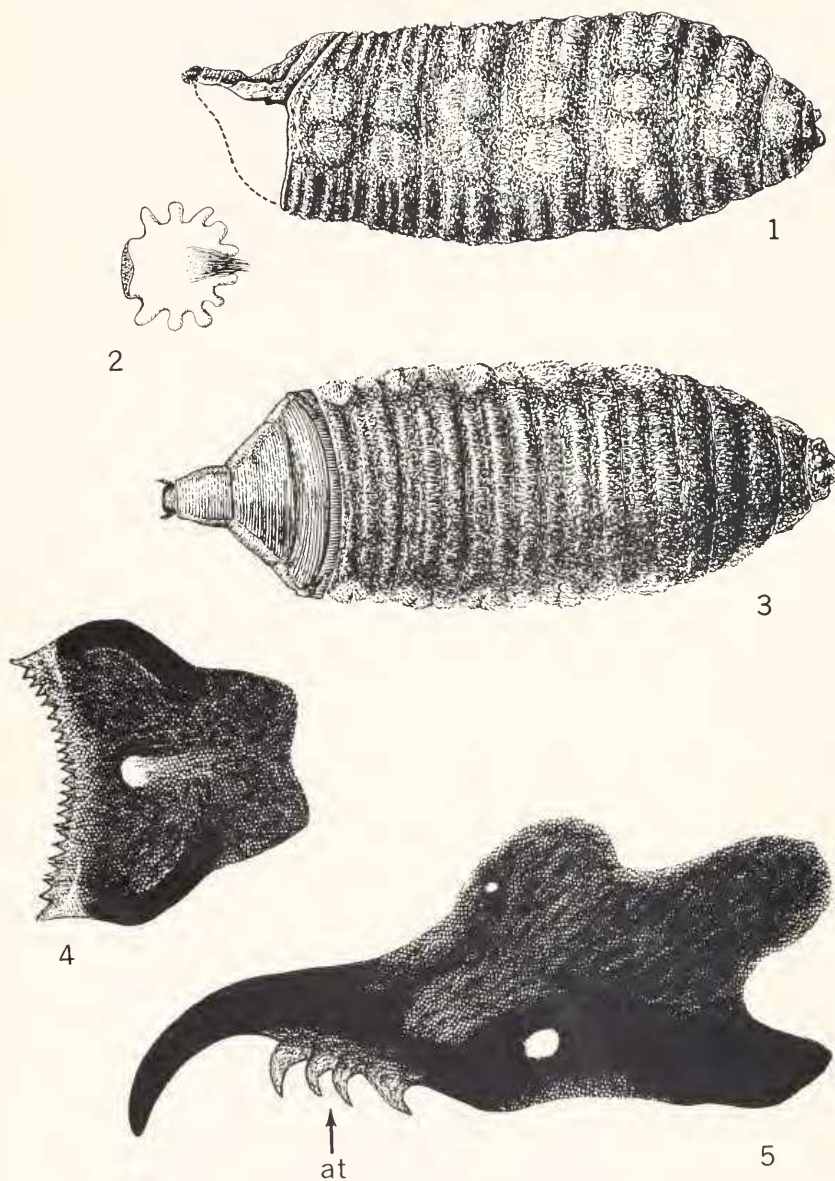
The pattern of light and dark areas of the wing of the 15 recently collected males and females (Fig. 9) is more regularly arranged than as shown in the holotype. The first, second, and third longitudinal veins usually are slightly and irregularly undulate along most of their length.

MALE

The following variations from the description of the male holotype were noted in the 7 additional males that I have seen. Wing length, 4.0-4.2 mm. Arista brown to black, occasionally yellowish at base. Propleuron with 1-4 small hairs. Thorax with 1 presutural bristle, 2 dorso-central bristles, and 0 or 1 prescutellar hairs or bristles. Hind femur with 1 or 2 dorsal pre-apical bristles. Abdominal terga, especially the posterior segments, with a few posterior marginal bristles stronger than other tergal bristles. Halter yellowish, base of stalk brownish, knob with a few short hairs, especially dorsobasally.

PUPARIUM (FIG 1-5)

Length, 4.6 mm; greatest width, 1.8 mm. Unicolorous dull reddish brown except second segment (first apparent segment) darker reddish with bases of spiracles black and posterior spiracular disc blackish. Integument with dense, uniform coat of fine, short processes that appear as velvety golden patches on tubercles and welts in certain lights; ventral spinule patches absent. Segments VI to XI strongly transversely wrinkled on all surfaces; vestiges of lateral tubercle groups only slightly protruding. Shape elongate cylindrical. Dorsal and ventral cephalic caps composed of invaginated segment I and segments II-V except posterior third of segment V; a strong ridge along lateral sutures from segment III-V. Anterior spiracles (Fig. 2) above mid-longitudinal axis; circular; external face shining yellowish white; moderately projecting from posterolateral margin of segment II; with dorsal and ventral rows of 5 papillae each; without papillae apically. Apparently only 2 pairs (ventral and ventro-lateral) of vestiges of posterior spiracular disc lobes. Posterior spiracles on mid-longitudinal axis, exceed-



FIGS. 1-5, *Pherbecta limenitis* Steyskal. FIG. 1. Puparium, lateral. FIG. 2. Anterior spiracle, from puparium. FIG. 3. Puparium, dorsal. FIG. 4. Ventral arch, dorsal. FIG. 5. Mouthhook, lateral. at, accessory teeth.

ingly short, each with 3 radiating spiracular slits, without interspiracular hairs. Anus only slightly invaginated.

Cephalopharyngeal skeleton length 0.5 mm, medium brown, moderately pigmented. Indentation index, 36. Similar to the cephalopharyngeal skeleton of *Pherbina*, *Psacadina*, and *Tetanocera*. Mouthhook (Fig. 5) narrowed anteriorly, hook-part well developed, black, but not as strongly recurved as in most genera; 4 lightly pigmented, acute, recurved accessory teeth situated almost horizontally behind hook-part on anteroventral margin of mouthhook. Ventral arch (Fig. 4) well developed, not fused with mouthhooks laterally, about 23 minute teeth on anterior margin. Hypostomal sclerite black, H-shaped. Ligulate sclerite indistinct. Epistomal sclerite with elongate posterior rami and broad, transverse anterior portion. Pharyngeal sclerite separate from hypostomal sclerite, with relatively shallow sinus; no anterodorsal bridge; upper cornu without window, lower cornu with window.

NEW DISTRIBUTIONAL RECORDS

CONNECTICUT. Beckley Pond, Norfolk, Litchfield Co., 28.VII.1964, L. L. Pechuman, 1 ♀, CU (Cornell University). MASSACHUSETTS. Bedford, swamp, 20.VII.1961, W. W. Wirth, 2 ♀ ♀ USNM (United States National Museum). NEW YORK. Oswego Co., St. Mary's Pond, near Parrish, 15.VII.1964, R. Silberglied, 1 ♀, USNM; 15.VII.1965, A. D. Bratt, 1 ♂, USNM, 2 ♂ ♂, CU; 15.VII.1965, L. V. Knutson, 2 ♀ ♀, USNM, 3 ♂ ♂, CU; 18.VII.1967, J. Abercrombie, 1 ♀, CU. ONTARIO. Torrance Bog (on Route 69 between Torrance and Gravenhurst), 19.VI.1960, L. L. Pechuman, 1 ♀, CU.

Dr. L. L. Pechuman has kindly provided me with the following notes on the above localities where he has collected *P. limenitis*. "Beckley Pond . . . Torrance Bog . . . and St. Mary's Pond are all rather typical sphagnum bogs with the usual orchids, pitcher plants, *Chamaedaphne*, *Andromeda*, etc. *Ledum* and *Kalmia* seem to be absent at St. Mary's Pond but present at Torrance . . . all have an open pond and all have a small stream entering and one leaving the bog. All have an open bog moor with vegetation only a few inches high but the open area is very restricted at Torrance. . . . On the higher ground around the three bogs is hemlock, sugar maple, yellow birch (also white birch at Torrance) with red maple and alder on the lower ground. All have a few cat-tails at the outer edges and . . . some *Decodon* overhanging the open pond in spots".

BIOLOGICAL NOTES

Two pairs of adults were collected on July 15, 1965 and placed in breeding jars. Copulation was observed on July 16, 17, 18, 21, 26, and August 2. One female laid about 20 eggs between July 22 and 30, and the other female laid 25 eggs between July 20 and 26. The eggs were laid on wet and dry cotton or peat moss substrate, on dry sticks, on shells of dead *Helisoma* snails, and on the dry sides of the jars, but none was laid on the shells of living aquatic snails included in the jars. A few eggs hatched between July 25 and 29 after incubation periods of about 3 days. First instar larvae were more active when they were allowed to float on the surface of the water than when they were left on damp cotton or moss, and they were observed to swallow air. Larvae were placed in shallow containers of water or on wet cotton with living *Lymnaea* sp., *Helisoma trivolvis* (Say), *Psidium* sp., *Physa* sp., crushed *H. trivolvis* and *Psidium* sp., and egg capsules of *Lymnaea* sp. No larvae were seen to attack or feed on these molluscs, and all larvae died within a few days of eclosion. Adults lived about 3 weeks in captivity. A puparium found floating amongst emergent vegetation at St. Mary's Pond on April 6, 1966 produced a male fly on April 20; the adult died on June 22.

TAXONOMIC PLACEMENT

On characters of the male, Steyskal placed *Pherbecta* with the genera of Tetanocerini (Tetanocerinae) that have vellar (subalar) bristles, and he indicated that *Pherbecta* is most similar to the Palearctic genus *Pherbina* Robineau-Desvoidy. Species of *Pherbina* have 1 or more strong bristles on the mesopleuron and pteropleuron, whereas *Pherbecta* has only fine hairs on these pleura. There are 2 pairs of thoracic dorsocentral bristles in *Pherbina*. The holotype of *Pherbecta limenitis* has only 1 pair of dorsocentrals, as described by Steyskal, but the other 14 specimens all have 2 pairs of dorsocentrals. The second antennal segment of *Pherbecta* is relatively shorter than that of *Pherbina*, and it is more similar to that of *Psacadina* Mayer. Distinctive features of the puparium, especially the absence of anterior papillae on the anterior spiracles, the unusual mouthhooks with accessory teeth placed almost horizontally behind the hook-part, and the characteristic ventral arch corroborate placement of *P. limenitis* as a separate genus.

ACKNOWLEDGEMENTS

Figures 1, 2, and 9 were prepared by A. D. Cushman, Systematic Entomology Laboratory, USDA. I am grateful to L. L. Pechuman for making special efforts to collect *Pherbecta*, and for notes on the habitats.

REFERENCE CITED

STEYSKAL, G. C. 1956. New species and taxonomic notes in the family Sciomyzidae (Diptera, Acalyptratae). Papers Michigan Acad. Sci., Arts, Letters. 41: 73-87.

2.0137. Description of the Female of *Pherbecta limenitis* Steyskal (Diptera: Sciomyzidae), with Notes on Biology, Immature Stages, and Distribution.

ABSTRACT.—Characters of the previously unknown female of *Pherbecta limenitis* Steyskal corroborate its placement as a distinct genus near *Pherbina*. The horizontal placement of the accessory teeth behind the hook-part of the mouth-hook is unique to this species. Mating, oviposition, and hatching of eggs were obtained in the laboratory but larvae did not feed on dead or living snails and fingernail clams offered to them. New records from New York, Connecticut, Massachusetts, and Ontario are included.—L. V. KNUTSON, Systematic Entomology Laboratory, USDA, c/o U. S. National Museum, Washington, D. C. 20560.

Descriptors: Diptera; Sciomyzidae; *Pherbecta limenitis*, biology, immature stages, distribution.